that does nothing to register and protect her ancient monuments."

It may be urged that we have the Ancient Monuments Protection Act, which Sir John Lubbock, after great labour, succeeded in passing through Parliament. This Act is valuable so far as it goes, but only 69 monuments in the British Islands (29 in England, 21 in Scotland, and 19 in Ireland) were specified in the schedule. Under Section 10 of the Act of 1882, Her Majesty may, by Order in Council, make additions to the list of monuments protected by the Act. This power has, however, been taken advantage of only to a very limited extent. It has been exercised on six occasions between 1887 and 1892, and 31 monuments (7 in England, 17 in Scotland, and 7 in Ireland) have been brought under the Act. Dr. Murray definitely states that "the Government have, in fact, rendered the Act inoperative, as regards the future, by steadily declining to accept further monuments even when offered to them." Ireland has been more fortunate; there are thus between 170 and 180 monuments in Ireland under public protection, as against 38 in Scotland and 36 in England.

Dr. Murray is not alone in his desire to see all our archæological remains preserved and described; but he has stated the case with enthusiasm and full knowledge in this little brochure.

Specialisation in scientific studies is necessary, but there is a great danger of weakness through sub-division. For example, archæological remains are relegated to archæologists and antiquarians, who are tacitly held responsible for them. Why should not professed historians and all who desire to intelligently understand the culture history of their native land, as well as of mankind in general, feel that they too are responsible for the record and preservation of these historical data? Few branches of unapplied science are of more national importance, and it would be well if the wave of patriotism that is now astir could be partially diverted towards this truly patriotic object.

THE INTERNATIONAL PHOTOGRAPHIC CATALOGUE AND CHART.

IN the month of May last year the permanent Comité International, for the execution of the Photographic Chart of the heavens, met at Paris to discuss various questions which had been left undecided at previous Conferences, and to inquire into the state of progress of the work of the various observatories participating in this international scheme. At these meetings, in addition to the members of the Committee, several guests were invited to be present and take part in the discussions.

The report of the proceedings, which has just been published, commences with a brief reference to the work of each of the observatories that is partaking in this scheme, the President (the late M. Tisserand) stating that the undertaking, as a whole, was in a satisfactory state of advancement. The report then refers somewhat in detail to the numerous questions that had been prepared for discussion at these May Conferences, from which we make the following brief abstracts.

With regard to the catalogue, the first resolution adopted, as the result of a special Committee of inquiry, composed of MM. Donner, Dunér, Jacoby, Paul Henry and Scheiner, was that the probable error of the values of the rectilinear coordinates measured on the plates ought to be as small as possible, and that the measures should be made such that this error should not exceed 0″·20.

It was further resolved to publish, as soon as possible, the rectilinear coordinates of the stars photographed, and that this publication should also contain the data necessary for converting these results into equatorial coordinates. The Committee expressed the desire that a provisional catalogue of right ascensions and declinations might be published by those observatories whose resources were sufficiently large. Each observatory is allowed to choose the positions of those stars of reference in the catalogues which appear the most convenient to them. For the calculation of the constants of the *clichés*, a minimum, if possible, of ten stars of reference must be allowed, and the adopted positions of these stars should be published. It was decided to postpone to a later date the discussion relative to the question of using a uniform system of constants for all the observatories for the reduction of the stars to the epoch 1900. All agreed, however, that an identical form of publication for all the observatories should be adopted, that of the catalogue of the Paris Observatory serving as the type. Each observatory can determine the photographic magnitudes, either by means of measurement or by estimation. The only stipulation the Committee imposes is that the methods employed must be such that the magnitudes in different observatories can be reduced to a common system.

With reference to the so-called photographic chart, five resolutions were adopted, namely:—

(1) That each observatory will be provided with a scale (furnished by Captain Abney) of densities, which will be impressed on the plates simultaneously with the *réseau*, by which the sensibility of each plate for the luminous objects of different intensities will be controlled.

(2) For the construction of the chart, the second series of *clichés*—that is, those whose centres are of unequal declination—will be exposed three times for a period of thirty minutes each. The time of exposure may be diminished if a decided increase in the sensibility of the photographed plate be noticed.

(3) The Committee selects, as the best method of reproducing the chart, the photogravure on copper from the *clichés*, with three exposures on them, the original scale being doubled.

(4) Each observatory will make two contact glass positives of each negative, one of which will be preserved in the building at Breteuil, part of the Bureau International des Poids et Mesures.

The next meeting of the Committee will probably occur on the occasion of the Universal Exhibition, in the year 1900.

NOTES.

THE announcement of the resignation of M. J. de Morgan, Director General of the Administration of Antiquities of Egypt, recently made by a contemporary, will be received with regret by many. It will be remembered that the duties of this gentleman were two-fold; he was supposed to excavate sites which promised good antiquarian results throughout Upper and Lower Egypt, and also to direct and manage the Ghizeh Museum near Cairo. It is not clear whether M. de Morgan has resigned both duties, but a well-founded rumour asserts that he is going to leave Egypt and to excavate in Persia on behalf of the French Government, who are said to have obtained a concession to dig for antiquities throughout the country, and to have leave to carry away whatever they may find. Whether M. de Morgan has severed his connection with Egypt wholly or partially matters very little relatively, but his resignation brings to the front the important question of what is to be done in the future about the conservation of the monuments which remain *in situ*, and those which are preserved in the National Museum. No one can deny that M. de Morgan has worked well in Egypt, and although much fault has been found with his "Catalogue" by those who have carefully read the work, none can deny that his excavations have been both thorough and successful, and that he has imparted new life to that branch of the Antiquity Department which is under his immediate control. Still, however, it is manifest that the Director cannot be both excavating and managing the Museum in Cairo at the same time, and that while the excavations have flourished the Museum has languished. All that could be done in the Museum by a subordinate official has been done by Brugsch Bey, whose archæological knowledge is first-rate; and what has been done is well done. But very much more needs doing, and when the new Museum is built, if it is to be a successful and useful institution, it must have an adequate staff, led by a permanent *resident* official, whose duty shall be to arrange, classify, label, and describe the various objects, and make them accessible to visitors under proper supervision. No Museum can flourish under the rule of a chief, who not only is non resident, but is for several months of the year away excavating sites which are remote from centres of postal and telegraphic communication. It is much to be hoped that the English authorities in Egypt will insist on the appointment of a director or keeper of the Museum, and of an official inspector and excavator; each official should have a "free hand" in his own department, and each should be answerable to some Minister of the Government only. The system hitherto followed has disheartened the staff, and has retarded the proper arrangement of the antiquities in the Ghizeh Museum.

SIR ARCHIBALD GEIKIE arrived in America a few days ago, intending to remain about one month, and to deliver the Williams course of lectures on geology at the Johns Hopkins University, Baltimore. A reception was given to him by the section of geology and mineralogy of the New York Academy of Sciences, and addresses were delivered by Prof. J. J. Stevenson, president of the Academy; Prof. Kemp, president of the section; by the secretary of the section, and by Mr. Heilprin, of Philadelphia. Sir Archibald Geikie responded, after which the members of the Academy and invited guests were presented to him individually.

A VERY important meeting of the Council of the American Association for the Advancement of Science was held at Washington a few days ago. Prof. Theodore Gill, vice-president of the section of zoology, succeeded to the office of president in succession to the late Prof. Cope, by virtue of his seniority, under the constitutional clause which devolves the duties of president upon the senior vice-president in such contingencies. As Prof. Cope had not prepared his annual address, Prof. Gill was requested by vote of the Council to deliver the presidential address in the form of an obituary of the late president, which he consented to do. Secretary Putnam read correspondence with Mr. Vernon Harcourt, conveying the invitation to all members of the American Association to attend the Toronto meeting on the same terms as to payment of dues as the members of the British Association; and to the officers of the Association to attend as honorary members. The Council authorised Secretary Putnam to return the thanks of the Association, and to invite foreign visitors to attend the meeting at Detroit, calling attention to the clause which admits them to honorary membership without payment of dues. It was also voted to invite such guests to register as honorary members of the several sections in which they are specially interested. Dr. L. O. Howard, of Washington, was nominated by the Council as vice-president for the section of zoology for the approaching meeting, in the place of the late Dr. G. Brown Goode. Secretary Putnam reported, as the result of a recent visit to Detroit, that the accommodations, both as to hotel headquarters and to place of meeting, were much superior to any before available. The new and spacious Hotel Cardillac will be the headquarters, and the immense new High School the place of all the meetings and gatherings. The school building has a hall capable of seating 2500 persons, and ample rooms for the sections.

THE annual visitation of Greenwich Observatory will take place on Saturday, June 5.

MR. J. WOLFE BARRY, C.B., F.R.S., and the Council of the Institution of Civil Engineers, have sent out invitations for a conversazione to be held at the Institution on Tuesday, May 25.

IT is stated in *Die Natur* that the valuable library of the late Prof. Du Bois Reymond has been purchased by the Prussian Government, and will be presented to the Berlin Physiological Society.

DR. KOLLE, of the Berlin Institute for Infectious Diseases, has (says the *British Medical Journal*) received a year's leave in order to proceed to Cape Colony, where he has been commissioned by the Cape Government to carry on the work of Prof. Koch. He will continue the investigation into rinderpest and leprosy, and organise stations for the study of those diseases.

WE regret to see the announcements of the death of the following men of science:—Prof. Léon du Pasquier, of Neuchâtel, author of a number of papers on the glacial geology of northern Switzerland; Mr. Hugh Nevill, of the Ceylon Civil Service, known by his zoological observations and collections; Dr. Magitot, member of the Paris Academy of Medicine, and one of the founders of the Société d'anthropologie; Edmund Neminar, formerly professor of mineralogy and petrography at Innsbruck; Dr. L. Martin, professor of mathematics at Klausenberg.

THE question whether the public has a right-of-way over the Giant's Causeway has just been decided in the negative by the Vice-Chancellor in the Dublin Courts. We have already noted that a syndicate had purchased the Causeway, and that their action in closing it against the public, who had had free access to it from time immemorial, caused great irritation. A Committee was formed to support the public rights, and some members of it asserted them by walking over the Causeway, with the result that an injunction was asked for to restrain further trespass. A right-of-way was pleaded; but the Vice-Chancellor held that as the Causeway did not lead to any public place, this plea could not be upheld. It is stated that an appeal will be lodged against this judgment.

AT the sixty-fifth annual meeting of the British Medical Association, to be held at Montreal from August 31 to September 3, inclusive, an address in Medicine will be given by Prof. W. Osler, an address in Surgery by Mr. W. M. Banks, and an address in Public Medicine by Dr. Herman M. Biggs. The president-elect is Dr. T. G. Roddick, professor of surgery in the Gill University, Montreal, and the sections, with their presidents, are as follows:—Medicine, Dr. Stephen Mackenzie. Surgery, Mr. Christopher Heath. Public Medicine, Dr. E. P. LaChapelle. Obstetrics and Gynæcology, Dr. W. J. Sinclair. Pharmacology and Therapeutics, Dr. D. J. Leech. Pathology and Bacteriology, Mr. Watson Cheyne, F.R.S. Psychology, Dr. R. M. Bucke. Ophthalmology, Mr. Edward Nettleship. Laryngology and Otology, Dr. Greville Macdonald. Anatomy and Physiology, Dr. Augustus D. Waller, F.R.S. Dermatology, Mr. Malcolm Morris.

IT has been arranged shortly to hold a Conference of the members of the Institution of Civil Engineers in London, under conditions which, it is hoped, may be convenient to many who are precluded from attending the weekly meetings during the Session, and may prove serviceable to all by the discussion of a wider range of subjects than can be dealt with on ordinary occasions. It is intended that the business of the Conference should differ from the ordinary proceedings of the Institution, in that papers descriptive of works executed should give place to brief statements concerning important debatable matters in engineering science and practice, introduced with a view to elicit discussion on the questions raised. This Conference is fixed for May 25, 26 and 27, the morning of each day (from 10.30 to 1.30) being devoted to the consideration of the above statements, and arrangements being made for inspections of engineering works in the afternoon. The work of the Conference will be carried out under the direction of the Council, with the assistance of seven sectional committees, consisting of members of the Institution, representative of various localities in the United Kingdom, and identified with the several branches of engineering. The sections and their chairmen are:—Railways: Sir Benjamin Baker, K.C.M.G. Harbours, Docks, and Canals: Mr. Harrison Hayter. Machinery and Transmission of Power: Sir Frederick Bramwell, Bart. Mining and Metallurgy: Mr. T. Forster Brown. Shipbuilding: Sir William H. White, K.C.B. Waterworks, Sewerage, and Gasworks: Mr. Mansergh; Applications of Electricity, Mr. Preece, C.B.

ENGLISH weather is as fruitful a subject for composition as it is a theme for conversation. Like many other people, Mr. C. A. Whitmore, M.P., is a devoted student of our meteorology, so that what he writes about it in the May number of the *National Review* is worth reading. Weather fallacies have been exposed times without number, but they are so deeply rooted in the minds of the unscientific that it may be doubted whether they will ever be completely eradicated. Mr. Whitmore throws doubt upon the popular impression that the changes of the moon synchronise with marked changes of weather. The few facts he states as to weather and lunar phases since the beginning of last summer, ought to convince people that their faith in the influence of the moon is misplaced. Another very common idea is that a heavy dew at night presages a fine day on the morrow, whereas it only indicates that the sky is clear and conditions are favourable for the deposition of dew. At certain times of the year a heavy dew is a sign of unstable rather than of stable weather. A luxuriant crop of berries in the autumn is said to forebode a severe winter; but the people who believe this, forget, or do not know, that the berries tell of conditions which have passed rather than of those to come. The temperature, sunshine, rainfall, abundance of insects, and other past causes which affect the birth and growth of plants, decide whether the berries shall be few or many, and not the future conditions. It is a beautiful sentiment to think that many berries are provided to furnish food for birds in a hard winter; but, unfortunately, nature does not furnish facts to support it. Having disposed of these and several more items of weather-lore, Mr. Whitmore supplies meteorologists with a few weather signs gained by his own observation and experience.

THE International Aeronautical Committee of Paris and Strassburg have proposed Thursday, May 13, at 3.30 a.m. local time, for the third international balloon ascents. This early hour of sending up unmanned balloons is proposed in order to study the true temperature of the air during the first part of the ascent; while the influence of solar radiation will be from the records obtained during the second part of the time. The results of the experiments of November 14 and February 18, showed that the thermometers were not sufficiently protected in the horizontal part of the trajectory, in which the ventilation is least active; hence it has been deemed necessary to make an important part of the ascent while the radiation of the sun is too weak to have any serious influence upon the thermometric results.

JAPAN is usually regarded as the country of earthquakes; but, if we take area into account, it would seem that shocks are still more numerous in Greece and the adjoining islands. Under the able superintendence of Dr. S. A. Papavasiliou, a geodynamic section of the Observatory of Athens was founded in 1893, and, since the summer of 1895, the seisimc organisation of the country has been actively at work. About a year ago, the publication of monthly bulletins was commenced with the number for January 1896, and the number for last December has been issued recently. The notices are nearly always very brief, and it is sometimes uncertain whether they refer to different shocks, or to observations of the same shock at different places. Making allowance for these cases, it would appear that the total number of earthquakes felt in the kingdom during 1896 was 529, or very nearly 1½ a day. Of this number, no fewer than 306 were recorded in the island of Zante alone.

THE property acquired by gases, after being traversed by electric sparks, of cooling heated bodies as if the gases had become better conductors of heat, forms the subject of a short note by Prof. E. Villari (*Rendiconti della R. Accademia di Napoli*). The phenomenon was observed by studying the action of different gases on a platinum spiral heated to redness by the electric current, the sparks being produced by a powerful coil reinforced by large Leyden jars. In some cases, the apparent cooling produced a fall of resistance of 10 per cent. Under similar conditions, the effect was nearly the same for oxygen, nitrogen, and air, but was much less marked in the case of hydrogen. It increases with the energy of the sparks, and also, at first, with the temperature of the spiral; but after this exceeds a certain limit, the refrigerating power decreases. Experiments made with a similar apparatus, with a view of testing whether Röntgen rays modify the thermal conductivity of the gases they traverse, have as yet given negative results.

UNDER the title of "Versuche über Hyperphosphorescenz," Profs. Elster and Geitel publish an interesting note on the invisible radiations from salts of uranium, discovered by Becquerel. The authors confirm Becquerel's statements as to the physical properties of these rays, and the fact, already noted in these columns (vol. xxxv. p. 119), that the salts may be kept in the dark for months without the radiation ceasing, so that the source of radiant energy is at present unknown. Uranium sulphate and sulphate of uranium and potassium are photo-electrically inactive, and the radiation is not materially promoted by sunlight. On the other hand, aluminium, zinc, luminous paint, and fluor spar, when light falls on them, do not, like these salts, emit dark radiations of sufficient intensity to impart electrical conductivity to the surrounding air. The conclusion is, that the present phenomena cannot be attributed to hyperphosphorescence. Profs. Elster and Geitel's paper is published in the *Jahresbericht des Vereins für Naturwissenschaft zu Braunschweig*, No. 10 (Brunswick, 1897).

IN a note in NATURE (December 31, 1896, p. 206) attention was drawn to an essay, by Prof. E. S. Morse, on problematical bronze or iron objects found in Greek, Roman and Etruscan tombs. Prof. D. G. Brinton (*Science*, 1897, p. 614) identifies the so-called "bow-puller" with the Greek myrmex (*μύρμηξ*) which, in pugilistic encounters, was strapped or chained on the hand over the leathern cestus.

THE large number of interesting Romano-British objects found in Thirst House Cave in Derbyshire, prove that this cave must have been occupied for a long period. It is unfortunate that, as in so many other instances, this important cave should not have been scientifically excavated. Casual cave-digging cannot be too strongly deprecated, as caves afford most valuable data for relative chronology, and it is a pity to have such important opportunities sometimes wasted by curiosity-hunters. Thirst House is probably derived from "The Hurst House," or the house in the wood. An interesting and illustrated account of the find is given, by J. Ward, in *The Reliquary and Illustrated Archæologist* (1897, p. 87).

F. H. CUSHING, in the *American Anthropologist* (vol. x. p. 17), suggests that the artificial deformation of the skull, like other mutilations of the person, were designed to liken a man either to his totem or to the animal whose distinguishing traits were essential to the office held by the man, and thus to confer through actual physical resemblance ideally conceived animal powers. The evidence Mr. Cushing adduces from America lends some support to this view, which may be an explanation of some, if not of all, the mutilations that have occurred in America. This theory is worth bearing in mind when considering analogous facts in other parts of the world.

THE question of suppressing the rabbit pest in Australia by employing the microbes of chicken cholera for their destruction, has been recently again brought prominently forward by the publication of an able report by the Government bacteriologist, Mr. C. J. Pound. This idea owes its origin, in the first instance, to Pasteur; but one of the principal objections raised at the time to its adoption in New South Wales was the reluctance felt to introduce a new disease, and one hitherto unknown in the Colony. Mr. Pound, however, commences his official document by the announcement that he has discovered the existence of chicken cholera in Queensland and New South Wales; and he describes in detail the various scientific investigations which he has made, placing its identification beyond all question. Experiments on a large scale were carried out last year to test the efficacy of this method of destroying rabbits; and the results were so encouraging, that the Government has been recommended to grant permission to farmers and others, who suffer from the depredations of these animals, to utilise this means of suppressing them. It has been calculated that two gallons of broth infected with chicken-cholera microbes added to pollard, is sufficient to destroy at least 20,000 rabbits, irrespective of infection induced by contagion. As, however, pellets of pollard infected with these microbes are rendered completely innocuous after three hours' exposure to the direct rays of the sun, the distribution of the morbific material over the fields is recommended to take place either just before or after sun-down.

THE Vermont Botanical Club, organised two years ago, now numbers sixty active members. It is vigorously prosecuting a botanical survey of the State.

WE have received the eighth part of vol. i. of the "Records of the Botanical Survey of India," consisting of a note on the botany of the Baluch-Afghan Boundary Commission of 1896, by Mr. F. P. Maynard and Mr. D. Prain.

A SECOND Appendix for 1897 of the *Kew Bulletin of Miscellaneous Information* is devoted to a list of plants brought into cultivation for the first time during the year 1896, or re-introduced after having been lost from cultivation. The list includes over 300 species.

THE recently established New York Botanical Garden is on a very large scale. The buildings, with decorative approaches and surroundings, will cover 25 acres; pines and other coniferous trees, 30 acres; deciduous trees, 70 acres; natural forest, mostly undisturbed, 25 acres; shrubs and small trees, 15 acres; herbaceous ground for scientific arrangement, 8 acres; bog garden, 5 acres; lakes and ponds, 6 acres; meadows, 10 acres. The museum building will have a frontage of 304 feet, with two wings each 200 feet in length.

THERE are several ways of cultivating interest in science, and not the least serviceable of them are works of fiction into which scientific facts and problems are woven. Mr. H. G. Wells commences a new story in the April number of *Pearson's Magazine*, entitled "The War of the Worlds," and its chief idea is an attack which inhabitants of Mars are supposed to make upon the earth. It is evident from many paragraphs that Mr. Wells reads his NATURE, and closely follows the planetary observations described in our astronomical column from time to time.

A NUMBER of our readers will be glad to have their attention called to the advertisement, appearing in another column, of a cruise to the capitals of the Baltic, visiting Christiania, Copenhagen, Stockholm (for the exhibition), and on to St. Petersburg for a seven days' sojourn in Moscow, returning by the Baltic Canal. The cruise is by the Albion Steamship Company's steam yacht *Norse King*, and starts from Newcastle-on-Tyne on May 22, returning on June 19.

THE extensive use of induction coils in surgical and physiological work with Röntgen rays, has created a demand for a practical book which shall show medical men, and others who have entered the new field of experiment, how to make the best use of their instruments. Mr. Lewis Wright, the author of well-known books on experimental optics and optical projection, has prepared a work of this kind, and it will be published in a few days by Messrs. Macmillan and Co. under the title, "The Induction Coil in Practical Work, including Röntgen X-Rays."

AMONG the noteworthy papers and other publications which have come under our notice within the past few days are the following:—The *Comptes rendus* of the works presented at the meetings of the Société Helvétique des Sciences Naturelles, held at Zermatt in 1895, and at Zürich in 1896; also the *Actes* (*Verhandlungen*) of the same meetings. The London agents of these publications are Messrs. Williams and Norgate.—"Le Climat de la Belgique en 1896" (pp. 190), by A. Lancaster. This essay is an excerpt from the *Annuaire* of the Royal Observatory at Brussels for 1897.—The third part of the Report of the International Meteorological Congress held at Chicago in August 1893 (pp. 585-772), edited by Oliver L. Fassig (*Bulletin* No. 11, U.S. Department of Agriculture, Weather Bureau). The report contains twelve papers on climatology, and ten on instruments and methods of investigation. All the papers are in English, and together they make a collection which British meteorologists will highly value.—*Proceedings* of the American Association for the Advancement of Science, for the meeting held at Buffalo in August 1896 (pp. 269). The addresses of the retiring President, Prof. E. W. Morley, and of the Presidents of the different Sections are printed in full, but only the titles of the papers read are given.—*Proceedings and Transactions* of the Nova Scotian Institute of Science, 1895-96. Among the subjects of the papers are the calculation of the conductivity of mixtures of electrolytes, and Nova Scotian undeveloped coal-fields, geology, and Orthoptera.—*Bulletin* of the American Museum of Natural History, vol. viii., 1896 (pp. 327). Several of the articles in this publication have already been noticed in NATURE, from authors' separate papers. Attention may, however, usefully be called to papers on alleged changes of colour in the feathers of birds without moulting, catalogue of meteorites in the American Museum of Natural History, the temple of Tepoztlan, Mexico (illustrated by five plates), descriptions of new North American mammals, notes on birds observed in Yucatan, and transformations of some North American Hawk-Moths.—*Atti della reale Accademia delle scienze fisiche e matematiche di Napoli*, second series, vol. viii., 1897. Eleven memoirs are included in this volume, and among the subjects dealt with are: a class of equations with derived partials, microscopic changes in nerve cells due to functional activity, and under the action of stimulating and destructive agents; earth currents recorded at the Vesuvius Observatory in 1895, and the history of Vesuvius from 1875 to 1895; a mathematical investigation of the lines of nodes of vibrating membranes; the geology of the Southern Appennines (this elaborate paper occupies 128 pages); the alternate current transformer with a condenser in the secondary circuit; the physical constitution of the atmosphere, from the results of observations made during eight balloon ascents by James Glaisher, also a new formula for the calculation of altitude from barometric observations.—In the *Rendiconti del Reale Istituto Lombardo*, Prof. Luigi de Marchi gives a mathematical investigation of the effect of viscosity on the movements of glaciers.

Now that acetylene can be readily prepared in the laboratory, many new uses will no doubt be found for it. The most recent proposal in this connection is that made by H. G. Söderbaum, in the current number of the *Berichte*. It appears that the gas can be employed for the quantitative precipitation of copper in ammoniacal solution, and for its separation from metals like zinc, which are not precipitated by ammonia. Acetylene possesses the great advantage over sulphuretted hydrogen, which is usually employed for this purpose, that it yields a precipitate which can be filtered and washed very rapidly, and which does not easily become oxidised and pass into solution. The washed precipitate is finally decomposed by dilute nitric acid, the solution filtered and evaporated to dryness, and the residue ignited and weighed as oxide.

The additions to the Zoological Society's Gardens during the past week include an Orang-outang (*Simia satyrus*, ♂) from Borneo, presented by Captain Francis R. Pelly, R N., H.M.S. *Porpoise*; a Bonnet Monkey (*Macacus sinicus*, ♂) from India, presented by Mrs. Douglas; a Rhesus Monkey (*Macacus rhesus*, ♂) from India, presented by Mr. P. A. Ledger; a Mongoose Lemur (*Lemur mongoz*) from Madagascar, presented by Mr. P. Baxter; a Grey Ichneumon (*Herpestes griseus*) from Ceylon, presented by Surgeon-Major C. Seymour; a Chimpanzee (*Anthropopithecus troglodytes*, ♀), a Black Gallinule (*Limnocorax niger*) from West Africa, presented by H.E. Colonel F. Cardew, C.M.G.; two Himalaya Goldfinches (*Carduelis caniceps*, ♂ ♀) from India, presented by Mr. Frank Finn; two Egyptian Geese (*Chenalopex ægyptiacus*, ♂ ♀) from Africa, presented by Mr. A. E. Speer; a Mauge's Dasyure (*Dasyurus viverrinus*) from Australia, presented by Mr. J. C. Chipper; a Peacock Pheasant (*Polyplectron chinquis*, ♂) from British Burmah, presented by Mr. Charlton Parr; a Burrhel Wild Sheep (*Ovis burrhel*, ♀) from the Himalayas, a Reed Buck (*Cervicapra arundinum*, ♂) from the Limpopo River, South-east Africa, a Sing-Sing Water Buck (*Cobus unctuosus*, ♂) from West Africa, a Somali Wild Ass (*Equus somilicus*, ♂), a Somali Ostrich (*Struthio molybdophanes*, ♂) from Somaliland, six Pintails (*Dafila acuta*, 3♂, 3♀), European; two Smith's Partridge Bronze-winged Pigeons (*Geophaps smithi*, ♂ ♀) from Australia, two White-headed Woodpeckers (*Leuconerpes candidus*) from Brazil, two Wreathed Hornbills (*Rhytidoceros undulatus*) from Borneo, a Silky Cow Bird (*Molothrus bonariensis*) from South America, purchased.

OUR ASTRONOMICAL COLUMN.

A Remarkable Relation between the Distances, Masses, and Surface Gravities of the Planets.—In the *Bulletin Astronomique* for April, M. P. Berthot describes an ingenious empirical law which approximately connects the mean radii (R) of the orbits, the masses (m), and the values of g at the equators of the different planets. By employing a graphical method in which the abscissæ represent the values of gravity (p), and the ordinates those of $\frac{R}{m}$, all the planets, with the exception of Mercury, fall very approximately on an ellipse, $\frac{R}{m}$ being considered negative for all values of p greater or equal to 1, and the unit value of p being that at the surface of the earth.

If $\frac{1}{p}$, instead of p, be used as the abscissæ, the ellipse becomes then an equilateral hyperbola, and if the logarithm of $\frac{1}{p}$ be substituted, the same becomes a parabola. The following table gives the true and calculated values of p for one of the three curves, namely, the ellipse, computed by M. Berthot, those for the hyperbola and parabola showing somewhat greater errors per cent. in the case of Mercury. These latter are not referred to below.

	$\frac{R}{m}$	p (true).	p (calc.) ellipse.	Error for 100.
Mercury ...	6·350 ...	0·439 ...	0·502 ...	14·3
Venus	0·919 ...	0·802 ...	0·803 ...	0·1
Earth	1·000 ...	1·000 ...	1·000 ...	0·0
Mars	14·510 ...	0·376 ...	0·375 ...	0·3
Jupiter ...	0·017 ...	2·261 ...	2·284 ...	1·0
Saturn	0·103 ...	0·892 ...	0·877 ...	1·7
Uranus ...	1·414 ...	0·754 ...	0·764 ...	1·3
Neptune ...	1·824 ...	1·142 ...	1·120 ...	2·0

To make Mercury conform with the values calculated by the above-mentioned formulæ, it is suggested that either the old value of the mass determined by Le Verrier (0·0715) must be adhered to (contrary to more recent investigations), or, if the mass $\frac{1}{9{,}700{,}000}$ be retained, the diameter of the planet must be assumed to be one-quarter too large by the phenomenon of irradiation.

The Double Star 44 Boötis.—This star, which was discovered on August 17, 1781, by Herschel, has recently (*Monthly Notices*, vol. lvii. No. 5) been pointed out by Mr. Burnham in consequence of the singular and remarkable arrest of the relative motion of the two stars. For a period of thirty years these stars gradually increased their distance from one another at a nearly uniform rate, the position angle at the same time slowly advancing. After this, for a period of equal length, the motion had apparently been arrested, and "down to the present time, they have remained absolutely at rest, so far as one can tell from full and careful sets of measures by the best double-star observers." This is a remarkable system, which evidently is unique among the known binaries, and, as Mr. Burnham points out, it is not easy to account for such a state of affairs. He remarks, however, that the usual dark-body hypothesis will readily suggest itself; and it is easy to imagine one of these stars with an invisible companion, both moving in a very eccentric orbit in a plane parallel to the line of sight, and to select a period and direction of motion that will not only explain the motion, but the absence of motion shown by the observations of the visible components, and "when this is presented with the usual refinements of computation, doubtless for the time being a plausible case could be made out." It will be interesting to watch this binary, and see, when the relative motion has been resumed and a decided change of position has taken place, whether an accurate, or even approximate, orbit can be obtained. The case is decidedly a unique one for double-star observers; and as there seems to be no question about the observations themselves, the steady change of position and subsequent arrest being based on "unimpeachable observations by the best observers," special interest will be attached to future measurements.

Report of Mr. Tebbutt's Observatory.—The energetic proprietor of this observatory presents a most satisfactory report for the year 1896, the amount of work accomplished being unusually large, owing to the very great number of clear nights experienced. The meridian work consisted chiefly in observing stars with the 3-inch transit instrument for checking the sidereal chronometer, which was used as timekeeper throughout the year. The observations of occultations of stars by the moon, made with the 8-inch equatorial, are stated to be the richest obtained in any one year since the foundation of the observatory. Other observations included 810 comparisons of minor planets with the filar micrometer, the phenomena of Jupiter's satellites, double and variable stars, and the regular meteorological work. The report states that all the astronomical and nearly all the meteorological observations were made by Mr. Tebbutt himself,